REMARKS

The Office Action mailed on December 13, 2002 and the references cited therewith have been reviewed. Claim 13 has been amended and claim 17 has been canceled. Claims 1-16, and 18-22 are now pending in this application.

Claim Rejections - 35 U.S.C. §103

In the Office Action, claims 1 and 2 were rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. (U.S. Patent No. 5,729,370) in view of Krajewksi (U.S. Patent No. 4,402,076). Respectfully, Applicant traverses this rejection.

Claim 1 is directed to a hybrid fiber/coax network. The network includes a head end, at least one optical distribution node coupled to the head end over at least one fiber optic link, and a plurality of coaxial cable links coupled to each of the at least one optical distribution node. A transmitter, disposed at the optical distribution node, that is responsive to signals from the plurality of coaxial cable links, converts analog signals to baseband digital signals and transmits the baseband digital signals to the head end over the at least one optical link. A receiver is disposed at the head end. The receiver is responsive to the baseband digital signals from the transmitter and converts the digital signals to analog signals for the head end.

None of the cited references, either alone or in combination, teach or suggest a hybrid fiber/coax network as recited in claim 1 of the present application. The Office Action takes the position that Bernstein "discloses a hybrid fiber/copper wire network." In particular, the Office Action takes the position that DLC 201 and 202 are transmitters and receivers as recited in claim 1 of the present application. The Office Action concedes that "Bernstein's aforementioned prior art system uses copper wire rather than coax cable. However, Bernstein teaches copper connections 'deliver POTS to customers, but are incapable of delivering video services which are available from CATV providers who will soon be offering POTS'." The Office Action also states "CATV providers use coax cable because these cables offer increased bandwidth over cable." The Office Action concludes that it "would have been obvious to one of

ordinary skill in the art to replace the copper wires with coax cable in order to provide increased bandwidth for the end user." The Office Action proposes using the DLC equipment 201, 202 in a system that uses coax cable.

Applicant respectfully submits that the proposed modification is improper. Bernstein "teaches away" from the modification suggested in the Office Action. The Abstract of Bernstein states the following:

> The present invention is an efficient method for upgrading telephone networks having a large number of copper wire pairs 31 that extend from a telephone central office 300 to a predetermined number of telephone customers 250. Such networks are referred to as narrowband communication networks. However, for telephone companies to be competitive with cable television providers who may soon be offering telephone service, they must upgrade their narrowband networks to handle video communication signals such as CATV. This is done in an efficient multi-step process keeping in mind the eventual network configuration. During the first step, optical cable 21 is installed between the telephone office and a remote terminal 310; and digital loop carrier (DLC) equipment 201,202 is connected at each end. *The DLC equipment is suitable for audio but not video communication signals. Thereafter, the DLC equipment is replaced at the telephone central office and at the remote terminal with broadband access (BA) equipment 203,204. The BA equipment is adapted to handle video communication signals. Finally, a broadband link 330 such as coaxial cable 34, or high speed modems 261 connected to copper wire-pairs 31, or wireless transmission is installed between the remote terminal and the telephone customers.*

See Bernstein, Abstract. In other words, Bernstein states that the "DLC equipment is suitable for audio but not video communication signals" and is replaced with "broadband access (BA) equipment 203,204" prior to installing a "broadband link 330 such as coaxial cable 34." Moreover, the Office Action provides no reasoning as to why one of ordinary skill in the art would ignore this "efficient multi-step process" of

incorporating cable in a network (which replaces the DLC equipment) and instead make the modification proposed in the Office Action. Therefore, it is respectfully submitted that one of ordinary skill in the art would not be motivated to use the DLC equipment with a coaxial cable as proposed in the Office Action.

There is no teaching or suggestion in Bernstein that the broadband access equipment 203, 204 includes a transmitter, disposed at the optical distribution node, that is responsive to signals from the plurality of coaxial cable links, that converts analog signals to baseband digital signals and that transmits the baseband digital signals to the head end over the at least one optical link as recited in claim 1 of the present application. Moreover, there is no teaching or suggestion in Bernstein that the broadband access equipment 203, 204 includes a receiver, disposed at the head end, that is responsive to the baseband digital signals from the transmitter and that converts the digital signals to analog signals for the head end as recited in claim 1 of the present application.

Therefore, based on the foregoing arguments, it is submitted that claim 1 is not obvious in light of the cited art and is allowable.

Claim 2 depends from claim 1 and is likewise allowable for at least the reasons set forth above with respect to claim 1.

Claim 3 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi as applied to claim 1, and further in view of Radice (U.S. Patent No. 5,138,440). Applicant respectfully traverses this rejection.

Claim 3 depends from claim 1 and is likewise allowable for at least the reasons set forth above with respect to claim 1.

Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi as applied to claim 1, and further in view of Hoffart (U.S. Patent No. 5,341,216) and Radice. Applicant respectfully traverses this rejection.

Claim 4 depends from claim 1 and is likewise allowable for at least the reasons set forth above with respect to claim 1.

Claim 5 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi as applied to claim 1, and further in view of Sayeed et al. (U.S. Patent No. 5,828,677) and Radice. Applicant respectfully traverses this rejection.

Claim 5 depends from claim 1 and is likewise allowable for at least the reasons set forth above with respect to claim 1.

Claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi as applied to claim 1, and further in view of Johnson et al. (U.S. Patent No. 3,995,144) and Petroff (U.S. Patent No. 5,198,989). Applicant respectfully traverses this rejection.

Claim 6 depends from claim 1 and is likewise allowable for at least the reasons set forth above with respect to claim 1.

Claims 7, 9, and 10 were rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi in further view of Bodeep et al. (U.S. Patent No. 5,864,672) in further view of Chambers et al. (U.S. Patent No. 5,867,485) in further view of Radice. Applicant respectfully traverses these rejections.

Claim 7 is directed to a transmitter for an optical distribution node. The transmitter includes at least one bandpass filter that is operable to select a portion of the frequency spectrum that is associated with return paths signals for a hybrid fiber/coax network. The transmitter also includes at least one analog to digital converter, responsive to the at least one bandpass filter, that creates baseband digital data from the return path signals. The transmitter further includes at least one multiplexer, responsive to the at least one analog to digital converter, that creates a serial data stream from the baseband digital data from the at least one analog to digital converter and an optical transmitter, responsive to the at least one multiplexer, that is operable to transmit the serial data to a head end as a digital baseband signal.

None of the cited references, either alone or in combination, teach or suggest the transmitter of claim 7. For example, none of the references either alone or in combination teach or suggest a transmitter including at least one bandpass filter that is

operable to select a portion of the frequency spectrum that is associated with return paths signals for a hybrid fiber/coax network. As with claim 1, the Office Action references the DLC equipment 201, 202 to support this rejection. However, as noted above, Bernstein teaches away from using the DLC equipment with a hybrid fiber/coax network. Bernstein states that the "DLC equipment is suitable for audio but not video communication signals" and is replaced with "broadband access (BA) equipment 203,204" prior to installing a "broadband link 330 such as coaxial cable 34." Moreover, the Office Action contains no reasoning as to why one of ordinary skill would ignore this approach to incorporating cable in a network and instead make the modification proposed in the Office Action. Therefore, it is respectfully submitted that one of ordinary skill in the art would not be motivated to use the DLC equipment with a coaxial cable as proposed in the Office Action.

Furthermore, there is no teaching or suggestion in Bernstein that the broadband access equipment includes at least one analog to digital converter, responsive to the at least one bandpass filter, that creates baseband digital data from the return path signals as recited in claim 7 of the present application. Moreover, there is no teaching or suggestion in Bernstein that the broadband access equipment includes at least one multiplexer, responsive to the at least one analog to digital converter, that creates a serial data stream from the baseband digital data from the at least one analog to digital converter and an optical transmitter, responsive to the at least one multiplexer, that is operable to transmit the serial data to a head end as a digital baseband signal as recited in claim 7 of the present application.

Therefore, based on the foregoing arguments, it is submitted that claim 7 is not obvious in light of the cited art and is allowable.

Claims 9 and 10 depend from claim 7 and are likewise allowable for at least the reasons set forth above with respect to claim 7.

Claim 8 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi in further view of Bodeep et al. in further view of

Chambers et al. in further view of Radice as applied to claim 7, and further in view of Smith, III (U.S. Patent No. 4,112,488). Applicant respectfully traverses this rejection.

Claim 8 depends from claim 7 and is likewise allowable for at least the reasons set forth above with respect to claim 7.

Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi in further view of Bodeep et al. in further view of Chambers et al. in further view of Radice as applied to claim 7, and further in view of Ferris (U.S. Patent No. 3,931,473). Applicant respectfully traverses this rejection.

Claim 11 depends from claim 7 and is likewise allowable for at least the reasons set forth above with respect to claim 7.

Claim 12 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi in further view of Bodeep et al. in further view of Chambers et al. in further view of Radice as applied to claim 7, and further in view of Sayeed et al. Applicant respectfully traverses this rejection.

Claim 12 depends from claim 7 and is likewise allowable for at least the reasons set forth above with respect to claim 7.

Claims 13 through 17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi in further view of Bodeep et al. Applicant respectfully traverses this rejection.

Amended claim 13 is directed to a method for processing data in a return path of a hybrid fiber/coax network. The method includes receiving analog, upstream data at an optical distribution node from at least one coaxial cable link and generating baseband digital data from the analog, upstream data. The method also includes creating a serial data stream including the digital data and driving a digital laser to transmit the digital data in a baseband digital format to a head end of a network.

Applicant has amended claim 13 to indicate that the method includes receiving analog, upstream data at an optical distribution node from at least one coaxial cable link. The Office Action references the DLC equipment 201, 202 of Bernstein to support this rejection. However, as noted above, Bernstein teaches away from using the DLC

equipment with a hybrid fiber/coax network. Therefore, it is respectfully submitted that one of ordinary skill in the art would not be motivated to use the DLC equipment with a coaxial cable as proposed in the Office Action. Moreover, Bernstein does not otherwise teach or suggest receiving analog, upstream data at an optical distribution node from at least one coaxial cable link as recited in amended claim 13 of the present application.

Therefore, based on the foregoing arguments, it is submitted that claim 13 is not obvious in light of the cited art and is allowable.

Claims 14 through 16 depend from claim 13 and are likewise allowable for at least the reasons set forth above with respect to claim 13. Claim 17 has been cancelled.

Claim 18 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi in further view of Radice in further view of Tsutsui (U.S. Patent No. 5,680,130). Applicant respectfully traverses this rejection.

Claim 18 is directed to a receiver for a digital data return path of a head end in a hybrid fiber/coax network. The receiver includes an optical receiver that is operable to receive a serial, digital baseband signal from an optical link. The receiver also includes at least one demultiplexer, responsive to the optical receiver, that demultiplexes the digital baseband signal. The receiver further includes at least one digital to analog converter, responsive to the at least one demultiplexer, that creates analog signals for the head end and at least one filter that is operable to compensate for quantization effects in the frequency spectrum that is associated with return path signals for a hybrid fiber/coax network.

None of the cited references, either alone or in combination, disclose the receiver recited in claim 18 of the present application. For example, none of the cited references, alone or in combination, teach or suggest a receiver having at least one filter that is operable to compensate for quantization effects in the frequency spectrum that is associated with return path signals for a hybrid fiber/coax network as recited in claim 18 of the present application. The Office Action references the DLC equipment 201, 202 of Bernstein to support this rejection. However, as noted above, Bernstein teaches away from using the DLC equipment with a hybrid fiber/coax network. Therefore, it is

respectfully submitted that one of ordinary skill in the art would not be motivated to use the DLC equipment with a coaxial cable as proposed in the Office Action. Moreover, Bernstein does not otherwise teach or suggest a receiver having at least one filter that is operable to compensate for quantization effects in the frequency spectrum that is associated with return path signals for a hybrid fiber/coax network as recited in claim 18 of the present application.

Therefore, based on the foregoing arguments, it is submitted that claim 18 is not obvious in light of the cited art and is allowable.

Claim 20 depends from claim 18 and is likewise allowable for at least the reasons set forth above with respect to claim 18.

Claim 19 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi in further view of Radice in further view of Tsutsui as applied to claim 18 above and further in view of Hoffart (U.S. Patent No. 5,341,216). Applicant respectfully traverses this rejection.

Claim 19 depends from claim 18 and is likewise allowable for at least the reasons set forth above with respect to claim 18.

Claim 21 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi in further view of Radice in further view of Tsutsui as applied to claim 18 and further in view of Ferris (U.S. Patent No. 3,931,473) and Brouard et al. (U.S. Patent No. 4,244,046). Applicant respectfully traverses this rejection.

Claim 21 depends from claim 18 and is likewise allowable for at least the reasons set forth above with respect to claim 18.

Claim 22 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. in view of Krajewksi in further view of Radice in further view of Tsutsui as applied to claim 18 and further in view of Sayeed et al. Applicant respectfully traverses this rejection.

Claim 22 depends from claim 18 and is likewise allowable for at least the reasons set forth above with respect to claim 18.

CONCLUSION

Claims 1-16 and 18-22 are currently pending. Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. If the Examiner has any questions or concerns regarding this application, please contact the undersigned at (612) 332-4720, ext. 226.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 502432.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

13. (Amended) A method for processing data in a return path of a hybrid fiber/coax network, the method comprising:

receiving analog, upstream data at an optical distribution node from at least one coaxial cable link;

generating baseband digital data from the analog, upstream data;

creating a serial data stream including the digital data; and

driving a digital laser to transmit the digital data in a baseband digital format to a head end of the network.